Technical Communications in Aeronautics: Results of an Exploratory Study

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Part 1*

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SURVEY INSTRUMENT

TECHNICAL COMMUNICATIONS IN AERONAUTICS

1. In your work, how important is it for *YOU* to communicate technical information effectively?   Col.

   ____ Very Important   ____ Somewhat Important   ____ Not at all Important   5

2. How many hours do *YOU* spend each week communicating technical information *TO* others? _____ Hours   6-7

3. How many hours do *YOU* spend each week working with technical communications *FROM* others? _____ Hours   8-9

4. As you have advanced professionally, how has the amount of time *YOU* spend communicating technical information *TO OTHERS* changed?

   ____ Increased   ____ Stayed the Same   ____ Decreased   10

5. As you have advanced professionally, how has the amount of time *YOU* spend working with technical communications received *FROM OTHERS* changed?

   ____ Increased   ____ Stayed the Same   ____ Decreased   11

6. Approximately how many times in the past *six months* did you write/prepare:

Letters	____ times in the past **6 months**	Journal articles	____	12-53
Memos	____	Conference/Meeting papers	____	
Technical reports-Government	____	Trade/Promotional literature	____	
Technical reports-Other	____	Press releases	____	
Proposals	____	Drawings/Specifications	____	
Technical manuals	____	Speeches	____	
Computer program documentation	____	Audio/Visual materials	____	

7. How many times in the past *one month* did you use materials written/prepared by other people?

Letters	____ # read/used in past **1 month**	Journal articles	____	54-89
Memos	____	Conference/Meeting papers	____	
Technical reports-Government	____	Trade/Promotional literature	____	
Technical reports-Other	____	Drawings/Specifications	____	
Proposals	____	Audio/Visual materials	____	
Technical Manuals	____			
Computer program documentation	____			

8. When you write/prepare technical communications, do you receive help from:

	Always	*Usually*	*Sometimes*	*Never*	90-95
Other colleagues	____	____	____	____	
Secretaries	____	____	____	____	
Technical writers or editors	____	____	____	____	
A thesaurus/dictionary	____	____	____	____	
A style manual	____	____	____	____	
A grammar hotline	____	____	____	____	
	1	2	3	4	

9. Which of the following statements *BEST* represents how the artwork for *YOUR* visual aids (charts, graphs) is prepared? (Check Only One)

1 _____ I do my own artwork without a computer   96
2 _____ I do my own artwork with a computer
3 _____ The graphics department does my artwork
4 _____ Sometimes I do it and sometimes the graphics department does it
5 _____ A secretary does it
6 _____ The artwork is prepared elsewhere

10. Have you ever taken a course(s) in technical communications/writing?

_____ Yes, as an   _____ Yes, after   _____ Yes, both   _____ No **(Skip to Q. 12)**   97
1   Undergraduate   2   graduation   3   4

11. How well did this course help *YOU* communicate technical information?

_____ A Lot   _____ A Little   _____ Did not Help   98
1   2   3

12. In your opinion, which of the following topics should be included in an **undergraduate** technical communications course for aeronautical engineers and scientists?

Yes	No	Principles	Yes	No	Mechanics
____	____	Defining the communication's purpose	____	____	Abbreviations
____	____	Assessing readers' needs	____	____	Acronyms
____	____	Organizing information	____	____	Capitalization
____	____	Developing paragraphs (introductions, transitions, and conclusions)	____	____	Numbers
			____	____	Punctuation
____	____	Writing sentences (active vs. passive voice, parallel ideas, shifts in person or tense)	____	____	References
____	____	Using standard English grammar	____	____	Spelling
____	____	Notetaking and quoting	____	____	Symbols
____	____	Editing and revising	1	2	
____	____	Choosing words (avoiding wordiness, jargon, slang, sexist terms)			
____	____	Using information technology (video conferencing, electronic data bases, etc.)			
1	2				

99-116

13. Which of the following on-the-job communications should be included in an **undergraduate technical communications course** for aeronautical engineers and scientists?

Yes	No		Yes	No	Reports:
____	____	Abstracts	____	____	Feasibility
____	____	Letters	____	____	Investigative
____	____	Memos	____	____	Laboratory
____	____	Instructions	____	____	Progress
____	____	Journal articles	____	____	Test
____	____	Literature reviews	____	____	Trip
____	____	Manuals	____	____	Trouble
____	____	Newsletter articles	1	2	
____	____	Oral presentations			
____	____	Specifications			
____	____	Use of information sources			
1	2				

117-134

14. Do *YOU* use computer technology to prepare technical communications?

_____ Always   _____ Usually   _____ Sometimes   _____ Never **(Skip to Q. 19)**   135
1   2   3   4

15. Has computer technology increased *YOUR* ability to communicate technical information?

_____ A Lot   _____ A Little   _____ Not at All   136
1   2   3

16. Do *YOU* use any of the following software for preparing written technical communications?

Yes	No		Yes	No	
____	____	Word processing	____	____	Thesaurus
____	____	Outliners and prompters	____	____	Business graphics
____	____	Grammar and style checkers	____	____	Scientific graphics
____	____	Spelling checkers			

137-143

1   2   (Word processing column)

1   2   (Scientific graphics column)

17. Do *YOU* use an integrated graphics, text, and modeling engineering workstation for preparing written technical communications?

____ Always   ____ Usually   ____ Sometimes   ____ Never   144
1   2   3   4

18. Do *YOU* use electronic or desk-top publishing systems for preparing written technical communications?

____ Always   ____ Usually   ____ Sometimes   ____ Never   145
1   2   3   4

19. How do *YOU* view your use of the following information technologies in communicating technical information?

Information Technologies	I already use it	I don't use it, but may in the future	I don't use it, and doubt if I will
Audio tapes and cassettes	____	____	____
Motion picture film	____	____	____
Video tape	____	____	____
Desk-top/electronic publishing	____	____	____
Floppy disks	____	____	____
Computer cassette/cartridge tapes	____	____	____
Electronic mail	____	____	____
Electronic bulletin boards	____	____	____
FAX or TELEX	____	____	____
Electronic data bases	____	____	____
Video conferencing	____	____	____
Teleconferencing	____	____	____
Micrographics and microforms	____	____	____
Laser disc/video disc/CD-ROM	____	____	____
Electronic networks	____	____	____
	1	2	3

146-160

20. When faced with solving a technical problem, do you get technical information from:

	Always	Usually	Sometimes	Never
Personal knowledge	____	____	____	____
Informal discussions with colleagues	____	____	____	____
Discussions with supervisors	____	____	____	____
Discussions with experts *in* your organization	____	____	____	____
Discussions with experts *outside* of your organization	____	____	____	____
Technical reports-Government	____	____	____	____
Technical reports-Other	____	____	____	____
Professional journals/conference meeting papers	____	____	____	____
Textbooks	____	____	____	____
Handbooks and standards	____	____	____	____
Technical information sources, such as on-line data bases, indexing and abstracting guides, CD-ROM, and current awareness tools	____	____	____	____
Librarians/technical information specialists	____	____	____	____
	1	2	3	4

161-172

99

21. What types of technical information do you *USE* in performing your present duties?

Yes	No		
___	___	Scientific and technical information	173-183
___	___	Experimental techniques	
___	___	Codes of standards and practices	
___	___	Design procedures and methods	
___	___	Computer programs	
___	___	Government rules and regulations	
___	___	In-house technical data	
___	___	Product and performance characteristics	
___	___	Economic information	
___	___	Technical specifications	
___	___	Patents	
1	2		

22. What types of technical information do you *PRODUCE* (or expect to produce) in performing your present duties?

Yes	No		
___	___	Scientific and technical information	184-194
___	___	Experimental techniques	
___	___	Codes of standards and practices	
___	___	Design procedures and methods	
___	___	Computer programs	
___	___	Government rules and regulations	
___	___	In-house technical data	
___	___	Product and performance characteristics	
___	___	Economic information	
___	___	Technical specifications	
___	___	Patents	
1	2		

23. How often do you use the library or a technical information center? (Circle Choice)   195

1 — Daily   4 — Two to three times a month
2 — Two to six times a week   5 — Once a month
3 — Once a week   6 — Less than once a month
                    7 — Do not use

24. Do you use electronic data bases to find bibliographic citations and abstracts?   1 — Yes   2 — No **(Skip to Q. 26)**   196

25. Do you (Circle One):   197

1 — Do *all* searches yourself   4 — Do *most* searches through an intermediary (e.g. librarian)
2 — Do *most* searches yourself   5 — Do *all* searches through an intermediary
3 — Do *half* by yourself and half through an
     intermediary (e.g. librarian)

THIS DATA WILL BE USED TO DETERMINE WHETHER PEOPLE WITH DIFFERENT BACKGROUNDS HAVE DIFFERENT TECHNICAL COMMUNICATION PRACTICES.

26. What is your gender?   1 — Male   2 — Female   198

27. What is your level of education?   199

1 — No degree   3 — Masters   5 — Other _____
2 — Bachelors   4 — Doctorate

28. How many years of professional work experience do you have? _____ Years   200-201

29. Type of organization where you work? (Circle Only One Number)   202

1 — Academic   4 — Government (Non-NASA)
2 — Industrial   5 — NASA
3 — Not-for-profit   6 — Other _____

(OVER)

30. What are your present professional duties? (Circle Only *One* Number)

01 — Research	06 — Manufacturing/Production
02 — Administration/Mgt. (for profit)	07 — Private Consultant
03 — Administration/Mgt. (not-for-profit sector)	08 — Service/Maintenance
04 — Design/Development	09 — Marketing/Sales
05 — Teaching/Academic	10 — Other _____

203-
204

31. What is your AIAA interest group? (Circle Only *One* Number)

1 — Aerospace Science	5 — Aerospace and Information Systems
2 — Aircraft Systems	6 — Administration/Management
3 — Structures, Design, and Test	7 — Other _____
4 — Propulsion and Energy	

205

32. Is American English your first (native) language?   1 — Yes   2 — No

206

33. Are you an Engineer or a Scientist?   1 — Engineer   2 — Scientist

207

34. Are there comments you would like to add about topics covered in this questionnaire?

_____

_____

_____

_____

_____

_____

35. What can be done to improve technical communications in aeronautics?

_____

_____

_____

_____

_____

_____

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            Old Dominion University
            Norfolk, VA 23529-0218

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AGGREGATE TOTALS

BLANK = 999

SKIP = 8

TECHNICAL COMMUNICATIONS IN AERONAUTICS

v1 1. In your work, how important is it for *YOU* to communicate technical information effectively?

<u>89.4</u> Very Important   <u>9.7</u> Somewhat Important   <u>.5</u> Not at all Important   3 blank   .4

v2 2. How many hours do *YOU* spend each week communicating technical information *TO* others? $\bar{x} = 13.95$ Hours

v3 3. How many hours do *YOU* spend each week working with technical communications *FROM* others? $\bar{x} = 12.57$ Hours

v4 4. As you have advanced professionally, how has the amount of time *YOU* spend communicating technical information *TO OTHERS* changed?

<u>71.5</u> Increased   <u>15.3</u> Stayed the Same   <u>12.9</u> Decreased   2 blank   .3

v5 5. As you have advanced professionally, how has the amount of time *YOU* spend working with technical communications received *FROM OTHERS* changed?

<u>60.6</u> Increased   <u>25.6</u> Stayed the Same   <u>12.7</u> Decreased   7 blank   1.1

6. Approximately how many times in the past *six months* did you write/prepare: **995 = 1,000 times**

v6 Letters	$\bar{x} = 22.2$ times in the past 6 months	**v13** Journal articles	$\bar{x} = 0.4$
v7 Memos	$\bar{x} = 28.8$	**v14** Conference/Meeting papers	$\bar{x} = 1.1$
v8 Technical reports-Government	$\bar{x} = 1.6$	**v15** Trade/Promotional literature	$\bar{x} = 0.3$
v9 Technical reports-Other	$\bar{x} = 1.9$	**v16** Press releases	$\bar{x} = 0.3$
v10 Proposals	$\bar{x} = 1.8$	**v17** Drawings/Specifications	$\bar{x} = 3.2$
v11 Technical manuals	$\bar{x} = 0.3$	**v18** Speeches	$\bar{x} = 2.2$
v12 Computer program documentation	$\bar{x} = 1.3$	**v19** Audio/Visual materials	$\bar{x} = 6.6$

7. How many times in the past *one month* did you use materials written/prepared by other people?

v20 Letters	$\bar{x} = 16.7$ # read/used in past 1 month	**v27** Journal articles	$\bar{x} = 6.7$
v21 Memos	$\bar{x} = 24.3$	**v28** Conference/Meeting papers	$\bar{x} = 4.3$
v22 Technical reports-Government	$\bar{x} = 4.2$	**v29** Trade/Promotional literature	$\bar{x} = 5.7$
v23 Technical reports-Other	$\bar{x} = 4.5$	**v30** Drawings/Specifications	$\bar{x} = 7.9$
v24 Proposals	$\bar{x} = 1.4$	**v31** Audio/Visual materials	$\bar{x} = 5.5$
v25 Technical Manuals	$\bar{x} = 2.2$		
v26 Computer program documentation	$\bar{x} = 3.0$		

8. When you write/prepare technical communications, do you receive help from:

	Always	*Usually*	*Sometimes*	*Never*		
v32 Other colleagues	<u>11.7</u>	<u>39.6</u>	<u>45.4</u>	<u>2.6</u>	4 blank	.7
v33 Secretaries	<u>23.3</u>	<u>27.7</u>	<u>35.6</u>	<u>12.9</u>	3 blank	.5
v34 Technical writers or editors	<u>1.5</u>	<u>4.6</u>	<u>38.1</u>	<u>51.2</u>	28 blank	4.6
v35 A thesaurus/dictionary	<u>21.0</u>	<u>28.7</u>	<u>41.1</u>	<u>7.4</u>	11 blank	1.8
v36 A style manual	<u>1.5</u>	<u>4.5</u>	<u>33.8</u>	<u>55.4</u>	29 blank	4.8
v37 A grammar hotline	<u>.2</u>	<u>.7</u>	<u>5.1</u>	<u>88.</u>	37 blank	6.0

     PAGE *102* INTENTIONALLY BLANK

9. Which of the following statements *BEST* represents how the artwork for *YOUR* visual aids (charts, graphs) is prepared? (Check Only One)

   ı <u>10.2</u> I do my own artwork without a computer
   ℓ <u>34.0</u> I do my own artwork with a computer   6 blank 1.0
v38 ℑ <u>16.5</u> The graphics department does my artwork
   ₄ <u>30.0</u> Sometimes I do it and sometimes the graphics department does it
   ₅ <u>6.3</u> A secretary does it
   ₆ <u>2.0</u> The artwork is prepared elsewhere

10. Have you ever taken a course(s) in technical communications/writing?   0 skip

v39 <u>24.4</u> Yes, as an   <u>19.6</u> Yes, after   <u>24.6</u> Yes, both   <u>31.4</u> No (Skip to Q. 12)
   ı Undergraduate   ℓ graduation   ℩   ₄

11. How well did this course help *YOU* communicate technical information?

v40 <u>42.5</u> A Lot   <u>54.1</u> A Little   <u>2.7</u> Did not Help   4 blank .7
   ı   ℓ   ℩

12. In your opinion, which of the following topics should be included in an **undergraduate** technical communications course for aeronautical engineers and scientists?

	Yes	No	Principles			Yes	No	Mechanics	
v41	90.3	9.2	Defining the communication's purpose 3 blank .5		v51	50.2	47.5	Abbreviations	14 blank 2.3
v42	80.9	18.1	Assessing readers' needs 6 blank 1.0		v52	48.7	49.2	Acronyms	13 blank 2.1
v43	96.0	3.5	Organizing information 3 blank 0.5		v53	59.6	38.1	Capitalization	14 blank 2.3
v44	85.8	13.7	Developing paragraphs (introductions, · transitions, and conclusions) 3 blank 0.5		v54	47.2	49.7	Numbers	19 blank 3.1
v45	79.7	20.0	Writing sentences (active vs. passive voice, parallel ideas, shifts in person or tense) 2 blank 0.3		v55	74.3	23.6	Punctuation	13 blank 2.1
					v56	75.1	22.8	References	13 blank 2.1
v46	77.4	22.1	Using standard English grammar 3 blank 0.5		v57	63.7	34.2	Spelling	13 blank 2.1
v47	49.3	49.4	Notetaking and quoting 8 blank 1.3		v58	55.9	41.8	Symbols	14 blank 2.3
v48	77.4	22.1	Editing and revising 3 blank 0.5			ı	ℓ		
v49	81.0	18.5	Choosing words (avoiding wordiness, jargon, slang, sexist terms) 3 blank 0.5						
v50	60.3	38.9	Using information technology (video conferencing, electronic data bases, etc.) 5 blank 0.8						
	ı	ℓ							

13. Which of the following on-the-job communications should be included in an **undergraduate technical communications course** for aeronautical engineers and scientists?

	Yes	No				Yes	No	Reports:	
v59	67.0	30.0	Abstracts	18 blank 3.0		v70	56.8	34.3	Feasibility	54 blank 8.9
v60	68.0	30.0	Letters	12 blank 2.0		v71	60.7	30.4	Investigative	54 blank 8.9
v61	76.4	21.8	Memos	11 blank 1.8		v72	64.7	26.6	Laboratory	53 blank 8.7
v62	56.1	41.3	Instructions	16 blank 2.6		v73	72.6	19.1	Progress	50 blank 8.3
v63	45.4	52.5	Journal articles	13 blank 2.1		v74	71.9	19.7	Test	51 blank 8.4
v64	36.3	61.1	Literature reviews	16 blank 2.6		v75	49.8	41.9	Trip	50 blank 8.3
v65	47.3	50.7	Manuals	12 blank 2.0		v76	46.5	44.9	Trouble	52 blank 8.6
v66	23.6	73.4	Newsletter articles	18 blank 3.0			ı	ℓ		
v67	93.6	4.6	Oral presentations	11 blank 1.8						
v68	54.5	43.2	Specifications	14 blank 2.3						
v69	77.2	20.5	Use of information sources	14 blank 2.3						
	ı	ℓ							

14. Do *YOU* use computer technology to prepare technical communications?   52 skip

v77 <u>38.3</u> Always   <u>31.5</u> Usually   <u>21.6</u> Sometimes   <u>8.6</u> Never (Skip to Q. 19)
   ı   ℓ   ℩   ₄

15. Has computer technology increased *YOUR* ability to communicate technical information?

v78 <u>56.4</u> A Lot   <u>30.2</u> A Little   <u>4.8</u> Not at All   52 blank 8.6
   ı   ℓ   ℩

16. Do *YOU* use any of the following software for preparing written technical communications?

	Yes	No						Yes	No				
				52 skip	8.5								
v79	85.8	5.1	Word processing	3 blank	.5		v83	28.7	61.6	Thesaurus	7 blank	1.2	
v80	9.7	80.2	Outliners and prompters	9 blank	1.5		v84	32.5	57.8	Business graphics	7 blank	1.2	
v81	10.2	79.9	Grammar and style checkers	8 blank	1.3		v85	58.3	32.2	Scientific graphics	6 blank	1.0	
v82	57.3	33.8	Spelling checkers	2 blank	.3								

17. Do *YOU* use an integrated graphics, text, and modeling engineering workstation for preparing written technical communications?

v86 _6.4_ Always   _10.1_ Usually   _24.6_ Sometimes   _49.2_ Never   52 skip 8.5

7 blank 1.2

18. Do *YOU* use electronic or desk-top publishing systems for preparing written technical communications?

v87 _10.7_ Always   _18.5_ Usually   _24.3_ Sometimes   _37.0_ Never   52 skip 8.5 •

6 blank 1.0

19. How do *YOU* view your use of the following information technologies in communicating technical information?

Information Technologies	I already use it	I don't use it, but may in the future	I don't use it, and doubt if I will			
v88 Audio tapes and cassettes	19.5	28.4	48.2	24 blank	3.9	
v89 Motion picture film	19.5	23.4	52.0	31 blank	5.1	
v90 Video tape	45.4	38.6	13.5	15 blank	2.5	
v91 Desk-top/electronic publishing	44.9	40.1	11.6	21 blank	3.4	
v92 Floppy disks	72.8	18.5	6.4	14 blank	2.3	
v93 Computer cassette/cartridge tapes	21.3	36.6	36.0	37 blank	6.1	
v94 Electronic mail	45.3	42.1	9.7	18 blank	2.9	
v95 Electronic bulletin boards	24.4	50.8	19.6	31 blank	5.2	
v96 FAX or TELEX	82.7	10.6	4.8	12 blank	1.9	
v97 Electronic data bases	47.9	38.4	8.9	29 blank	4.8	
v98 Video conferencing	15.7	59.9	20.5	24 blank	3.9	
v99 Teleconferencing	56.8	30.0	9.9	20 blank	3.3	
v100 Micrographics and microforms	16.5	40.4	35.0	49 blank	8.1	
v101 Laser disc/video disc/CD-ROM	5.8	61.1	27.2	36 blank	5.9	
v102 Electronic networks	30.5	50.0	14.2	32 blank	5.3	

20. When faced with solving a technical problem, do you get technical information from:

	Always	Usually	Sometimes	Never			
v103 Personal knowledge	42.5	45.5	11.2	1.0	6 blank	0.8	
v104 Informal discussions with colleagues	19.8	56.8	22.3	.3	5 blank	0.8	
v105 Discussions with supervisors	9.9	34.3	46.7	7.1	12 blank	2.0	
v106 Discussions with experts *in* your organization	18.5	50.2	29.0	1.2	7 blank	1.1	
v107 Discussions with experts *outside* of your organization	6.1	19.1	65.5	8.3	6 blank	1.0	
v108 Technical reports-Government	5.8	27.4	59.9	5.9	6 blank	1.0	
v109 Technical reports-Other	5.6	29.4	60.7	3.1	7 blank	1.2	
v110 Professional journals/conference meeting papers	9.2	25.4	52.5	11.4	9 blank	1.5	
v111 Textbooks	8.7	30.5	53.5	6.3	6 blank	1.0	
v112 Handbooks and standards	6.6	27.1	54.6	9.4	14 blank	2.3	
v113 Technical information sources, such as on-line data bases, indexing and abstracting guides, CD-ROM, and current awareness tools	1.2	6.8	43.2	45.4	21 blank	3.4	
v114 Librarians/technical information specialists	2.6	11.2	65.0	19.6	9 blank	1.6	

21. What types of technical information do you *USE* in performing your present duties?

	Yes	No				
v115	96.4	3.0	Scientific and technical information	4 blank	0.6
v116	59.9	39.3	Experimental techniques	5 blank	0.8
v117	47.4	51.8	Codes of standards and practices	5 blank	0.8
v118	55.4	43.7	Design procedures and methods	5 blank	0.9
v119	80.2	19.1	Computer programs	4 blank	0.7
v120	71.3	27.9	Government rules and regulations	4 blank	0.8
v121	89.9	9.4	In-house technical data	5 blank	0.7
v122	71.8	27.6	Product and performance characteristics	4 blank	0.6
v123	35.5	63.7	Economic information	5 blank	0.8
v124	76.4	22.9	Technical specifications	4 blank	0.7
v125	14.0	85.3	Patents	4 blank	0.7
	1	2			

22. What types of technical information do you *PRODUCE* (or expect to produce) in performing your present duties?

	Yes	No				
v126	91.6	7.8	Scientific and technical information	4 blank	0.6
v127	44.4	55.0	Experimental techniques	4 blank	0.6
v128	20.8	78.5	Codes of standards and practices	4 blank	0.7
v129	46.5	52.5	Design procedures and methods	6 blank	1.0
v130	56.8	42.6	Computer programs	4 blank	0.6
v131	15.2	83.7	Government rules and regulations	7 blank	1.1
v132	84.3	15.0	In-house technical data	4 blank	0.7
v133	57.8	41.4	Product and performance characteristics	5 blank	0.8
v134	27.1	72.3	Economic information	4 blank	0.6
v135	59.2	40.1	Technical specifications	4 blank	0.7
v136	18.0	81.4	Patents	4 blank	0.6
	1	2			

23. How often do you use the library or a technical information center? (Circle Choice)

v137
1 2.0 Daily
2 9.9 Two to six times a week
3 14.9 Once a week
4 19.1 Two to three times a month
5 16.8 Once a month
6 30.7 Less than once a month
7 5.9 Do not use

4 blank 0.7

v138 24. Do you use electronic data bases to find bibliographic citations and abstracts?   1 43.7 Yes   2 55.4 No (Skip to Q. 26)

5 blank 0.9

25. Do you (Circle One):

v139
1 3.0 Do *all* searches yourself
2 6.9 Do *most* searches yourself
3 5.3 Do *half* by yourself and half through an intermediary (e.g. librarian)
4 15.2 Do *most* searches through an intermediary (e.g. librarian)
5 12.7 Do *all* searches through an intermediary

341 skip 56.3
4 blank 0.6

THIS DATA WILL BE USED TO DETERMINE WHETHER PEOPLE WITH DIFFERENT BACKGROUNDS HAVE DIFFERENT TECHNICAL COMMUNICATION PRACTICES.

v140 26. What is your gender?   1 95.2 Male   2 4.8 Female

27. What is your level of education?

v141
1 0.7 No degree
2 32.7 Bachelors
3 43.6 Masters
4 22.6 Doctorate
5 0.4 Other _____

1-5	17.7	26-30	77.4
6-10	35.0	31-35	88.6
11-15	44.7	36-40	96.7
16-20	54.1	41-45	99.0
21-25	63.2	46-99	100.0

v142 28. How many years of professional work experience do you have? _____ Years

29. Type of organization where you work? (Circle Only One Number)

v143
1 6.8 Academic
2 62.0 Industrial
3 2.8 Not-for-profit
4 16.0 Government (Non-NASA)
5 12.2 NASA
6 .2 Other _____

30. What are your present professional duties? (Circle Only *One* Number)

    01 <u>19.5</u> Research   06 <u>1.7</u> Manufacturing/Production

    02 <u>15.3</u> Administration/Mgt. (for profit)   07 <u>2.3</u> Private Consultant

v144 03 <u>8.4</u> Administration/Mgt. (not-for-profit sector)   08 <u>.2</u> Service/Maintenance   2 blank 0.3

    04 <u>37.3</u> Design/Development   09 <u>3.8</u> Marketing/Sales

    05 <u>5.8</u> Teaching/Academic   10 <u>5.4</u> Other _____

31. What is your AIAA interest group? (Circle Only *One* Number)

    1 <u>30.2</u> Aerospace Science   5 <u>7.9</u> Aerospace and Information Systems

    2 <u>13.5</u> Aircraft Systems   6 <u>6.2</u> Administration/Management   8 blank 1.3

v145 3 <u>13.5</u> Structures, Design, and Test   7 <u>7.6</u> Other _____

    4 <u>19.8</u> Propulsion and Energy

v146 32. Is American English your first (native) language?   1 <u>93.6</u> Yes   2 <u>6.4</u> No

v147 33. Are you an Engineer or a Scientist?   1 <u>89.2</u> Engineer   2 <u>10.1</u> Scientist   4 blank 0.7

34. Are there comments you would like to add about topics covered in this questionnaire?

_____

_____

_____

_____

_____

_____

_____

35. What can be done to improve technical communications in aeronautics?

_____

_____

_____

_____

_____

_____

_____

Mail to: Dr. M. Glassman
               Dept. of Marketing
               Old Dominion University
               Norfolk, VA 23529-0218

APPENDIX C

CROSS TABULATIONS

PART A

Significant at P < .05 with no more than 20% expected values less than 5

SPSS/PC+

Crosstabulation: V32   RECEIVE HELP FROM COLLEAGUES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V32						
ALWAYS	1	4	39	12	13	68
		7.0	10.4	12.4	17.8	11.3
USUALLY	2	16	162	36	25	239
		28.1	43.3	37.1	34.2	39.8
SOMETIMES	3	30	164	49	35	278
		52.6	43.9	50.5	47.9	46.3
NEVER	4	7	9			16
		12.3	2.4			2.7
Column Total		57 9.5	374 62.2	97 16.1	73 12.1	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
33.70301	9	.0001	1.517	3 OF 16 (18.8%)

Number of Missing Observations =   5

SPSS/PC+

Crosstabulation: V33   HELP FROM SECRETARIES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V33						
ALWAYS	1	13	103	11	14	141
		22.8	27.5	11.3	18.9	23.4
USUALLY	2	13	103	35	17	168
		22.8	27.5	36.1	23.0	27.9
SOMETIMES	3	24	122	35	34	215
		42.1	32.6	36.1	45.9	35.7
NEVER	4	7	46	16	9	78
		12.3	12.3	16.5	12.2	13.0
Column Total		57 9.5	374 62.1	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
17.86622	9	.0368	7.385	None

Number of Missing Observations =   4

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Crosstabulation: V39   EVER TAKEN A TECH COMM COURSE

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V39						
YES, UNDERGRADUA	1	15 / 25.9	91 / 24.2	28 / 28.9	13 / 17.6	147 / 24.3
YES, AFTER GRADU	2	9 / 15.5	74 / 19.7	16 / 16.5	20 / 27.0	119 / 19.7
YES, BOTH	3	5 / 8.6	99 / 26.3	28 / 28.9	17 / 23.0	149 / 24.6
NO	4	29 / 50.0	112 / 29.8	25 / 25.8	24 / 32.4	190 / 31.4
Column Total		58 / 9.6	376 / 62.1	97 / 16.0	74 / 12.2	605 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
20.28448	9	.0162	11.408	None

Number of Missing Observations =   1

Crosstabulation: V59   ABSTRACTS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V59						
YES	1	49 / 87.5	234 / 63.8	68 / 73.9	55 / 76.4	406 / 69.2
NO	2	7 / 12.5	133 / 36.2	24 / 26.1	17 / 23.6	181 / 30.8
Column Total		56 / 9.5	367 / 62.5	92 / 15.7	72 / 12.3	587 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
16.58825	3	.0009	17.267	None

Number of Missing Observations =   19

APPENDIX C
SPSS/PC+

Crosstabulation: V62   INSTRUCTIONS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V62						
YES	1	35 61.4	217 59.5	58 60.4	29 40.8	339 57.6
NO	2	22 38.6	148 40.5	38 39.6	42 59.2	250 42.4
	Column Total	57 9.7	365 62.0	96 16.3	71 12.1	589 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.32028	3	.0253	24.194	None

Number of Missing Observations =   17

SPSS/PC+

Crosstabulation: V63   JOURNAL ARTICLES

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V63						
YES	1	40 70.2	145 39.4	44 46.3	46 63.9	275 46.5
NO	2	17 29.8	223 60.6	51 53.7	26 36.1	317 53.5
	Column Total	57 9.6	368 62.2	95 16.0	72 12.2	592 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
29.05115	3	.0000	26.478	None

Number of Missing Observations =   14

APPENDIX C
SPSS/PC+

Crosstabulation: V68   SPECIFICATIONS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V68						
YES	1	24 42.1	219 59.7	53 55.8	33 45.8	329 55.7
NO	2	33 57.9	148 40.3	42 44.2	39 54.2	262 44.3
	Column Total	57 9.6	367 62.1	95 16.1	72 12.2	591 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.45637	3	.0238	25.269	None

Number of Missing Observations =   15

SPSS/PC+

Crosstabulation: V69   USE OF INFO SOURCES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V69						
YES	1	43 75.4	301 82.0	77 80.2	47 66.2	468 79.2
NO	2	14 24.6	66 18.0	19 19.8	24 33.8	123 20.8
	Column Total	57 9.6	367 62.1	96 16.2	71 12.0	591 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.59858	3	.0223	11.863	None

Number of Missing Observations =   15

APPENDIX C

SPSS/PC+

Crosstabulation: V70   FEASIBILITY REPORTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V70						
YES	1	20 41.7	223 64.5	60 64.5	40 62.5	343 62.3
NO	2	28 58.3	123 35.5	33 35.5	24 37.5	208 37.7
	Column Total	48 8.7	346 62.8	93 16.9	64 11.6	551 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.57217	3	.0226	18.120	None

Number of Missing Observations =   55

SPSS/PC+

Crosstabulation: V75   TRIP REPORTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V75						
YES	1	20 41.7	195 56.0	59 62.8	27 41.5	301 54.2
NO	2	28 58.3	153 44.0	35 37.2	38 58.5	254 45.8
	Column Total	48 8.6	348 62.7	94 16.9	65 11.7	555 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
10.48652	3	.0149	21.968	None

Number of Missing Observations =   51

SPSS/PC+

Crosstabulation: V77   USE COMPUTER TECHNOLOGY

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V77						
ALWAYS	1	25 43.1	120 31.9	42 43.3	44 59.5	231 38.2
USUALLY	2	14 24.1	127 33.8	35 36.1	15 20.3	191 31.6
SOMETIMES	3	13 22.4	91 24.2	16 16.5	11 14.9	131 21.7
NEVER	4	6 10.3	38 10.1	4 4.1	4 5.4	52 8.6
Column Total		58 9.6	376 62.1	97 16.0	74 12.2	605 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
27.13709	9	.0013	4.985	1 OF 16 (6.3%)

Number of Missing Observations =   1

SPSS/PC+

Crosstabulation: V82   SPELLING CHECKERS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V82						
YES	1	28 54.9	201 59.6	66 71.0	51 72.9	346 62.8
NO	2	23 45.1	136 40.4	27 29.0	19 27.1	205 37.2
Column Total		51 9.3	337 61.2	93 16.9	70 12.7	551 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
8.48464	3	.0370	18.975	None

Number of Missing Observations =   55

APPENDIX C
SPSS/PC+

Crosstabulation: V83   THESAURUS

V143-) V83	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	12 23.5	107 32.0	39 42.4	16 23.2	174 31.9
NO	2	39 76.5	227 68.0	53 57.6	53 76.8	372 68.1
Column Total		51 9.3	334 61.2	92 16.8	69 12.6	546 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
8.72396	3	.0332	16.253	None

Number of Missing Observations =   60

SPSS/PC+

Crosstabulation: V85   SCIENTIFIC GRAPHICS

V143-) V85	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	35 67.3	208 62.5	54 58.7	56 80.0	353 64.5
NO	2	17 32.7	125 37.5	38 41.3	14 20.0	194 35.5
Column Total		52 9.5	333 60.9	92 16.8	70 12.8	547 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
9.48492	3	.0235	18.442	None

Number of Missing Observations =   59

APPENDIX C

SPSS/PC+

Crosstabulation: V86   USE AN INTEGRATED GRAPHICS TEXT

			ACADEMIC	INDUS-	GOVT	NASA		
		Count	NON-PROF	TRIAL				Row
V143->)		Col Pct						Total
			1	2	4	5		
V86								
ALWAYS	1		2	18	7	12		39
			3.8	5.4	7.6	17.6		7.1
USUALLY	2		5	33	11	12		61
			9.6	9.9	12.0	17.6		11.2
SOMETIMES	3		14	94	25	15		148
			26.9	28.1	27.2	22.1		27.1
NEVER	4		31	189	49	29		298
			59.6	56.6	53.3	42.6		54.6
	Column		52	334	92	68		546
	Total		9.5	61.2	16.8	12.5		100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
19.03954	9	.0249	3.714	2 OF 16 (12.5%)

Number of Missing Observations = 60

SPSS/PC+

Crosstabulation: V89   MOTION PICTURE FILM

			ACADEMIC	INDUS-	GOVT	NASA		
		Count	NON-PROF	TRIAL				Row
V143->)		Col Pct						Total
			1	2	4	5		
V89								
ALREADY USE IT	1		16	56	26	20		118
			29.1	15.8	28.0	28.2		20.6
DON'T BUT MAY	2		17	90	19	16		142
			30.9	25.4	20.4	22.5		24.7
DOUBT IF I WILL	3		22	209	48	35		314
			40.0	58.9	51.6	49.3		54.7
	Column		55	355	93	71		574
	Total		9.6	61.8	16.2	12.4		100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
15.95798	6	.0140	11.307	None

Number of Missing Observations = 32

APPENDIX C
SPSS/PC+

Crosstabulation: V91   DESK-TOP/ELECTRONIC PUBLISHING

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V91						
	1	20	165	44	43	272
ALREADY USE IT		35.7	45.2	46.8	62.3	46.6
	2	25	155	42	20	242
DON'T BUT MAY		44.6	42.5	44.7	29.0	41.4
	3	11	45	8	6	70
DOUBT IF I WILL		19.6	12.3	8.5	8.7	12.0
Column		56	365	94	69	584
Total		9.6	62.5	16.1	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
12.63612	6	.0492	6.712	None

Number of Missing Observations =   22

SPSS/PC+

Crosstabulation: V94   ELECTRONIC MAIL

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V94						
	1	27	147	46	53	273
ALREADY USE IT		49.1	40.4	48.4	72.6	46.5
	2	22	176	41	16	255
DON'T BUT MAY		40.0	48.4	43.2	21.9	43.4
	3	6	41	8	4	59
DOUBT IF I WILL		10.9	11.3	8.4	5.5	10.1
Column		55	364	95	73	587
Total		9.4	62.0	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
26.07522	6	.0002	5.528	None

Number of Missing Observations =   19

APPENDIX C

Crosstabulation: V95   ELECTRONIC BULLETIN BOARDS

V143->)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V95						
ALREADY USE IT	1	14 26.4	67 18.8	26 27.7	41 57.7	148 25.8
DON'T BUT MAY	2	28 52.8	207 58.1	48 51.1	24 33.8	307 53.5
DOUBT IF I WILL	3	11 20.8	82 23.0	20 21.3	6 8.5	119 20.7
Column Total		53 9.2	356 62.0	94 16.4	71 12.4	574 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
47.74792	6	.0000	10.988	None

Number of Missing Observations =   32

Crosstabulation: V97   ELECTRONIC DATA BASES

V143->)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V97						
ALREADY USE IT	1	16 29.6	195 54.6	45 47.9	33 46.5	289 50.2
DON'T BUT MAY	2	33 61.1	129 36.1	40 42.6	31 43.7	233 40.5
DOUBT IF I WILL	3	5 9.3	33 9.2	9 9.6	7 9.9	54 9.4
Column Total		54 9.4	357 62.0	94 16.3	71 12.3	576 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
13.89788	6	.0308	5.063	None

Number of Missing Observations =   30

APPENDIX C
SPSS/PC+

Crosstabulation: V98   VIDEO CONFERENCING

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V98						
ALREADY USE IT	1	3 5.6	59 16.4	9 9.5	23 31.9	94 16.2
DON'T BUT MAY	2	30 55.6	231 64.2	59 62.1	43 59.7	363 62.5
DOUBT IF I WILL	3	21 38.9	70 19.4	27 28.4	6 8.3	124 21.3
Column Total		54 9.3	360 62.0	95 16.4	72 12.4	581 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
34.48282	6	.0000	8.737	None

Number of Missing Observations =   25

SPSS/PC+

Crosstabulation: V99   TELECONFERENCING

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V99						
ALREADY USE IT	1	19 33.9	227 62.5	46 48.4	51 71.8	343 58.6
DON'T BUT MAY	2	27 48.2	103 28.4	36 37.9	16 22.5	182 31.1
DOUBT IF I WILL	3	10 17.9	33 9.1	13 13.7	4 5.6	60 10.3
Column Total		56 9.6	363 62.1	95 16.2	71 12.1	585 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
25.99568	6	.0002	5.744	None

Number of Missing Observations =   21

APPENDIX C

SPSS/PC+

Crosstabulation: V102   ELECTRONIC NETWORKS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V102						
ALREADY USE IT	1	16 29.6	98 27.6	30 32.3	40 56.3	184 32.1
DON'T BUT MAY	2	28 51.9	203 57.2	48 51.6	24 33.8	303 52.9
DOUBT IF I WILL	3	10 18.5	54 15.2	15 16.1	7 9.9	86 15.0
Column Total		54 9.4	355 62.0	93 16.2	71 12.4	573 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
23.27959	6	.0007	8.105	None

Number of Missing Observations =   33

SPSS/PC+

Crosstabulation: V105   DISCUSSIONS WITH SUPERVISORS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V105						
ALWAYS	1	2 3.6	40 10.9	10 10.3	8 11.0	60 10.1
USUALLY	2	14 25.5	139 37.8	31 32.0	24 32.9	208 35.1
SOMETIMES	3	23 41.8	169 45.9	51 52.6	39 53.4	282 47.6
NEVER	4	16 29.1	20 5.4	5 5.2	2 2.7	43 7.3
Column Total		55 9.3	368 62.1	97 16.4	73 12.3	593 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
47.24618	9	.0000	3.988	1 OF 16 (6.3%)

Number of Missing Observations =   13

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APPENDIX C

Crosstabulation: V110   JOURNAL/MEETING PAPERS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V110						
ALWAYS	1	10 17.5	18 4.9	13 13.5	14 19.2	55 9.2
USUALLY	2	23 40.4	85 23.0	21 21.9	25 34.2	154 25.8
SOMETIMES	3	24 42.1	216 58.4	50 52.1	28 38.4	318 53.4
NEVER	4		51 13.8	12 12.5	6 8.2	69 11.6
Column Total		57 9.6	370 62.1	96 16.1	73 12.2	596 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
45.22013	9	.0000	5.260	None

Number of Missing Observations =   10

Crosstabulation: V111   TEXTBOOKS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V111						
ALWAYS	1	8 14.3	24 6.5	10 10.3	11 14.9	53 8.8
USUALLY	2	26 46.4	104 28.0	30 30.9	24 32.4	184 30.7
SOMETIMES	3	21 37.5	217 58.3	52 53.6	34 45.9	324 54.1
NEVER	4	1 1.8	27 7.3	5 5.2	5 6.8	38 6.3
Column Total		56 9.3	372 62.1	97 16.2	74 12.4	599 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.60234	9	.0145	3.553	3 OF 16 (18.8%)

Number of Missing Observations =   7

121

Crosstabulation: V114   LIBRARIANS/TECH INFO SPECIALISTS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V114						
ALWAYS	1	1 1.8	10 2.7	4 4.1	1 1.4	16 2.7
USUALLY	2	4 7.3	40 10.8	7 7.2	17 23.0	68 11.4
SOMETIMES	3	45 81.8	238 64.3	68 70.1	42 56.8	393 65.9
NEVER	4	5 9.1	82 22.2	18 18.6	14 18.9	119 20.0
Column Total		55 9.2	370 62.1	97 16.3	74 12.4	596 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
20.24043	9	.0165	1.477	3 OF 16 (18.8%)

Number of Missing Observations =   10

Crosstabulation: V117   CODES OF STANDARD AND PRACTICES

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V117						
YES	1	15 25.9	200 53.8	42 43.3	30 40.5	287 47.8
NO	2	43 74.1	172 46.2	55 56.7	44 59.5	314 52.2
Column Total		58 9.7	372 61.9	97 16.1	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
18.84074	3	.0003	27.697	None

Number of Missing Observations =   5

APPENDIX C

Crosstabulation: V118   DESIGN PROCEDURES

V143-> V118	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	20 34.5	232 62.4	50 51.5	34 45.9	336 55.9
NO	2	38 65.5	140 37.6	47 48.5	40 54.1	265 44.1
	Column Total	58 9.7	372 61.9	97 16.1	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.82106	3	.0001	25.574	None

Number of Missing Observations =   5

Crosstabulation: V120   GOVT RULES AND REGULATIONS

V143-> V120	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	20 34.5	275 73.7	81 84.4	56 75.7	432 71.9
NO	2	38 65.5	98 26.3	15 15.6	18 24.3	169 28.1
	Column Total	58 9.7	373 62.1	96 16.0	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
48.70339	3	.0000	16.309	None

Number of Missing Observations =   5

APPENDIX C
SPSS/PC+

Crosstabulation: V121   IN-HOUSE TECH DATA

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V121						
YES	1	36 62.1	354 94.9	89 91.8	66 89.2	545 90.5
NO	2	22 37.9	19 5.1	8 8.2	8 10.8	57 9.5
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
63.46654	3	.0000	5.492	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V122   PRODUCT AND PERFORMANCE CHARACTERICTICS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V122						
YES	1	28 48.3	294 78.8	71 73.2	42 56.8	435 72.3
NO	2	30 51.7	79 21.2	26 26.8	32 43.2	167 27.7
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
33.56801	3	.0000	16.090	None

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V123   ECONOMIC INFORMATION

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V123 YES	1	18 / 31.0	151 / 40.6	28 / 28.9	18 / 24.3	215 / 35.8
NO	2	40 / 69.0	221 / 59.4	69 / 71.1	56 / 75.7	386 / 64.2
Column Total		58 / 9.7	372 / 61.9	97 / 16.1	74 / 12.3	601 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
10.56137	3	.0144	20.749	None

Number of Missing Observations =   5

SPSS/PC+

Crosstabulation: V124   TECHNICAL SPECIFICATIONS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V124 YES	1	32 / 55.2	311 / 83.4	73 / 75.3	47 / 63.5	463 / 76.9
NO	2	26 / 44.8	62 / 16.6	24 / 24.7	27 / 36.5	139 / 23.1
Column Total		58 / 9.6	373 / 62.0	97 / 16.1	74 / 12.3	602 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
31.84762	3	.0000	13.392	None

Number of Missing Observations =   4

APPENDIX C

Crosstabulation: V125   PATENTS

V143-)	Count Col Pct	ACADEMIC NON-PROF	INDUS- TRIAL	GOVT	NASA	Row
		1	2	4	5	Total
V125						
YES	1	4 6.9	66 17.7	9 9.3	6 8.1	85 14.1
NO	2	54 93.1	307 82.3	88 90.7	68 91.9	517 85.9
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
10.50657	3	.0147	8.189	None

Number of Missing Observations =   4

Crosstabulation: V127   EXPERIMENTAL TECHNIQUES

V143-)	Count Col Pct	ACADEMIC NON-PROF	INDUS- TRIAL	GOVT	NASA	Row
		1	2	4	5	Total
V127						
YES	1	33 56.9	155 41.6	40 41.2	41 55.4	269 44.7
NO	2	25 43.1	218 58.4	57 58.8	33 44.6	333 55.3
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
8.88488	3	.0309	25.917	None

Number of Missing Observations =   4

APPENDIX C

Crosstabulation: V128   CODES OF STANDARDS AND PRACTICES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V128						
YES	1	6 10.3	82 22.0	27 27.8	11 14.9	126 20.9
NO	2	52 89.7	291 78.0	70 72.2	63 85.1	476 79.1
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.61661	3	.0348	12.140	None

Number of Missing Observations =   4

Crosstabulation:.   V131   GOVT RULES AND REGULATIONS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V131						
YES	1	5 8.6	15 4.0	52 54.2	20 27.0	92 15.4
NO	2	53 91.4	356 96.0	44 45.8	54 73.0	507 84.6
	Column Total	58 9.7	371 61.9	96 16.0	74 12.4	599 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
157.53396	3	.0000	8.908	None

Number of Missing Observations =   7

APPENDIX C

SPSS/PC+

Crosstabulation: V132   IN-HOUSE TECH DATA

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V132						
YES	1	36 62.1	329 88.2	84 86.6	62 83.8	511 84.9
NO	2	22 37.9	44 11.8	13 13.4	12 16.2	91 15.1
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
27.02444	3	.0000	8.767	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V133   PRODUCT AND PERFORMANCE CHARACTERICTICS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V133						
YES	1	19 32.8	251 67.3	51 53.1	29 39.2	350 58.2
NO	2	39 67.2	122 32.7	45 46.9	45 60.8	251 41.8
	Column Total	58 9.7	373 62.1	96 16.0	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
40.12593	3	.0000	24.223	None

Number of Missing Observations =   5

.

APPENDIX C
SPSS/PC+

Crosstabulation: V134   ECONOMIC INFORMATION

V143-) V134	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	10 17.2	117 31.4	24 24.7	13 17.6	164 27.2
NO	2	48 82.8	256 68.6	73 75.3	61 82.4	438 72.8
Column Total		58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.92916	3	.0192	15.801	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V135   TECHNICAL SPECIFICATIONS

V143-) V135	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	23 39.7	248 66.5	49 50.5	39 52.7	359 59.6
NO	2	35 60.3	125 33.5	48 49.5	35 47.3	243 40.4
Column Total		58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
21.72406	3	.0001	23.412	None

Number of Missing Observations =   4

APPENDIX C
SPSS/PC+

Crosstabulation: V138   USE ELECTRONIC DATA BASES TO FIND CITATI

V143-> Col Pct	ACADEMIC NON-PROF	INDUS- TRIAL	GOVT	NASA	Row
Count	1	2	4	5	Total
V138					
1 YES	36 62.1	144 38.7	40 41.2	45 60.8	265 44.1
2 NO	22 37.9	228 61.3	57 58.8	29 39.2	336 55.9
Column Total	58 9.7	372 61.9	97 16.1	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.68692	3	.0001	25.574	None

Number of Missing Observations =   5

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APPENDIX C

CROSS TABULATIONS

PART B

Not statistically significant at P < .05

SPSS/PC+

Crosstabulation: V1   IMPORTANCE OF COMMUNICATING TECH INFO IN

```
              Count  IACADEMICIINDUS-  IGOVT   INASA    I
   V143-)     Col Pct INON-PROFITRIAL   I       I       I Row
                     I     1 I      2 I      4 I      5 I Total
V1            --------+--------+--------+--------+--------+
           1 I    54 I   337 I    83 I    67 I   541
 VERY IMPORTANT I 93.1 I  89.9 I  85.6 I  91.8 I  89.7
                +--------+--------+--------+--------+
           2 I     3 I    38 I    13 I     5 I    59
 SOMEWHAT IMPORTA I 5.2 I  10.1 I  13.4 I   6.8 I   9.8
                +--------+--------+--------+--------+
           3 I     1 I       I       I     1 I     1 I     3
 NOT AT ALL IMPOR I 1.7 I       I   1.0 I   1.4 I    .5
                +--------+--------+--------+--------+
          Column      58     375      97      73     603
          Total      9.6    62.2    16.1    12.1   100.0
```

```
Chi-Square    D.F.     Significance      Min E.F.     Cells with E.F.( 5
----------    ----     ------------      --------     ------------------

 8.83476       6          .1831            .289       4 OF    12 ( 33.3%)
```

Number of Missing Observations =   3

SPSS/PC+

Crosstabulation: V2   HOURS/WEEK COMMUNICATING TO OTHER

```
              Count  IACADEMICIINDUS-  IGOVT   INASA    I
   V143-)     Col Pct INON-PROFITRIAL   I       I       I Row
                     I     1 I      2 I      4 I      5 I Total
V2            --------+--------+--------+--------+--------+
           5 I    10 I    58 I    18 I    16 I   102
 5 hrs or less   I 17.2 I  15.7 I  18.8 I  22.2 I  17.1
                +--------+--------+--------+--------+
          10 I    12 I   125 I    26 I    26 I   189
 6 to 10 hrs   I 20.7 I  33.9 I  27.1 I  36.1 I  31.8
                +--------+--------+--------+--------+
          20 I    29 I   144 I    40 I    23 I   236
 11 to 20 hrs  I 50.0 I  39.0 I  41.7 I  31.9 I  39.7
                +--------+--------+--------+--------+
          21 I     7 I    42 I    12 I     7 I    68
 21 hrs or more I 12.1 I  11.4 I  12.5 I   9.7 I  11.4
                +--------+--------+--------+--------+
          Column      58     369      96      72     595
          Total      9.7    62.0    16.1    12.1   100.0
```

```
Chi-Square    D.F.     Significance      Min E.F.     Cells with E.F.( 5
----------    ----     ------------      --------     ------------------

 8.59357       9          .4756            6.629       None
```

Number of Missing Observations =   11

APPENDIX C

SPSS/PC+

Crosstabulation: V3   HOURS/WEEK WITH COMMUNICATIONS FROM OTHE

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V3						
5 hrs or less	5	15 25.9	76 20.5	21 21.9	14 19.4	126 21.1
6 to 10 hrs	10	20 34.5	140 37.8	30 31.3	31 43.1	221 37.1
11 to 20 hrs	20	19 32.8	127 34.3	30 31.3	21 29.2	197 33.1
21 hrs or more	21	4 6.9	27 7.3	15 15.6	6 8.3	52 8.7
Column Total		58 9.7	370 62.1	96 16.1	72 12.1	596 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.47693	9	.3945	5.060	None

Number of Missing Observations =   10

SPSS/PC+

Crosstabulation: V4   CHANGE IN COMM TO OTHERS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V4						
INCREASED	1	45 77.6	264 70.6	66 68.0	57 77.0	432 71.6
STAYED THE SAME	2	10 17.2	56 15.0	15 15.5	12 16.2	93 15.4
DECREASED	3	3 5.2	54 14.4	16 16.5	5 6.8	78 12.9
Column Total		58 9.6	374 62.0	97 16.1	74 12.3	603 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.51219	6	.2761	7.502	None

Number of Missing Observations =   3

132

APPENDIX C
SPSS/PC+

Crosstabulation: V5   CHANGE IN COMM WITH OTHERS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V5						
INCREASED	1	34	225	57	50	366
		59.6	60.6	59.4	67.6	61.2
STAYED THE SAME	2	18	92	25	20	155
		31.6	24.8	26.0	27.0	25.9
DECREASED	3	5	54	14	4	77
		8.8	14.6	14.6	5.4	12.9
Column		57	371	96	74	598
Total		9.5	62.0	16.1	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
6.48625	6	.3710	7.339	None

Number of Missing Observations =   8

SPSS/PC+

Crosstabulation: V34   HELP FROM TECH WRITERS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V34						
ALWAYS	1	1	3	2	3	9
		1.9	.8	2.1	4.3	1.6
USUALLY	2	1	15	6	6	28
		1.9	4.2	6.4	8.7	4.9
SOMETIMES	3	17	148	31	35	231
		31.5	41.1	33.0	50.7	40.0
NEVER	4	35	194	55	25	309
		64.8	53.9	58.5	36.2	53.6
Column		54	360	94	69	577
Total		9.4	62.4	16.3	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
18.59815	9	.0288	.842	6 OF 16 (37.5%)

Number of Missing Observations =   29

APPENDIX C
SPSS/PC+

Crosstabulation: V35   HELP FROM THESAURUS/DICTIONARY

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V35						
ALWAYS	1	13 / 23.2	67 / 18.1	27 / 27.8	20 / 28.2	127 / 21.4
USUALLY	2	10 / 17.9	117 / 31.6	25 / 25.8	22 / 31.0	174 / 29.3
SOMETIMES	3	27 / 48.2	152 / 41.1	42 / 43.3	27 / 38.0	248 / 41.8
NEVER	4	6 / 10.7	34 / 9.2	3 / 3.1	2 / 2.8	45 / 7.6
Column Total		56 / 9.4	370 / 62.3	97 / 16.3	71 / 12.0	594 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
16.61311	9	.0551	4.242	1 OF 16 (6.3%)

Number of Missing Observations =   12

SPSS/PC+

Crosstabulation: V36   HELP FROM STYLE MANUAL

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V36						
ALWAYS	1	1 / 1.9	6 / 1.7		2 / 3.0	9 / 1.6
USUALLY	2	1 / 1.9	15 / 4.2	7 / 7.4	4 / 6.0	27 / 4.7
SOMETIMES	3	21 / 38.9	124 / 34.3	40 / 42.6	20 / 29.9	205 / 35.6
NEVER	4	31 / 57.4	216 / 59.8	47 / 50.0	41 / 61.2	335 / 58.2
Column Total		54 / 9.4	361 / 62.7	94 / 16.3	67 / 11.6	576 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
8.87830	9	.4486	.844	6 OF 16 (37.5%)

Number of Missing Observations =   30

SPSS/PC+

Crosstabulation: V37   HELP FROM A GRAMMAR HOTLINE

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V37						
ALWAYS	1		1			1
			.3			.2
USUALLY	2		1	2	1	4
			.3	2.2	1.5	.7
SOMETIMES	3	2	18	7	4	31
		3.9	5.0	7.5	6.0	5.5
NEVER	4	49	337	84	62	532
		96.1	94.4	90.3	92.5	93.7
Column		51	357	93	67	568
Total		9.0	62.9	16.4	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.48327	9	.6907	.090	10 OF 16 (62.5%)

Number of Missing Observations =   38

SPSS/PC+

Crosstabulation: V38   HOW IS YOUR ARTWORK PREPARED

```
            Count  IACADEMICIINDUS-  IGOVT    INASA    I
   V143-)   Col Pct INON-PROFITRIAL  I        I        I Row
                   I      1 I     2 I     4 I     5 I Total
V38          ---------+---------+---------+---------+---------+
          1  I     4 I    45 I    10 I     3 I    62
DO OWN ARTWORK W I   7.1 I  12.1 I  10.4 I   4.1 I  10.4
                +---------+---------+---------+---------+
          2  I    22 I   113 I    38 I    32 I   205
DO ARTWORK WITH I  39.3 I  30.3 I  39.6 I  43.2 I  34.2
                +---------+---------+---------+---------+
          3  I    12 I    62 I    12 I    14 I   100
GRAPHICS DEPT DO I  21.4 I  16.6 I  12.5 I  18.9 I  16.7
                +---------+---------+---------+---------+
          4  I    15 I   120 I    28 I    19 I   182
I & GRAPHICS DEP I  26.8 I  32.2 I  29.2 I  25.7 I  30.4
                +---------+---------+---------+---------+
          5  I     2 I    24 I     6 I     6 I    38
SECRETARY DOES I I   3.6 I   6.4 I   6.3 I   8.1 I   6.3
                +---------+---------+---------+---------+
          6  I     1 I     9 I     2 I         I    12
PREPARED ELSEWHE I   1.8 I   2.4 I   2.1 I         I   2.0
                +---------+---------+---------+---------+
         Column      56       373       96       74      599
          Total      9.3      62.3     16.0     12.4    100.0
```

```
Chi-Square    D.F.      Significance      Min E.F.      Cells with E.F.< 5
----------    ----      ------------      --------      -------------------

15.17671       15          .4388           1.122        5 OF    24 ( 20.8%)

Number of Missing Observations =       7
```

APPENDIX C
SPSS/PC+

Crosstabulation: V40   HOW HELPFUL WAS TECH COURSE

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V40						
A LOT	1	6	123	29	16	174
		20.7	47.3	40.3	32.0	42.3
A LITTLE	2	22	128	40	33	223
		75.9	49.2	55.6	66.0	54.3
DID NOT HELP	3	1	9	3	1	14
		3.4	3.5	4.2	2.0	3.4
Column Total		29 7.1	260 63.3	72 17.5	50 12.2	411 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
11.47502	6	.0748	.988	3 OF 12 (25.0%)

Number of Missing Observations =   195

SPSS/PC+

Crosstabulation: V41   DEFINING COMM PURPOSE

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V41						
YES	1	47	346	87	66	546
		83.9	92.3	89.7	89.2	90.7
NO	2	9	29	10	8	56
		16.1	7.7	10.3	10.8	9.3
Column Total		56 9.3	375 62.3	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
4.45165	3	.2166	5.209	None

Number of Missing Observations =   4

Crosstabulation: V42   ASSESSING READERS NEEDS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V42						
YES	1	42	313	81	54	430
		75.0	83.9	83.5	74.0	81.8
NO	2	14	60	16	19	109
		25.0	16.1	16.5	26.0	18.2
Column		56	373	97	73	599
Total		9.3	62.3	16.2	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.05367	3	.1090	10.190	None

Number of Missing Observations =   7

Crosstabulation: V43   ORGANIZING INFORMATION

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V43						
YES	1	52	363	95	71	581
		91.2	96.8	99.0	95.9	96.5
NO	2	5	12	1	3	21
		8.8	3.2	1.0	4.1	3.5
Column		57	375	96	74	602
Total		9.5	62.3	15.9	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.59630	3	.0859	1.988	3 OF 8 (37.5%)

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V44   DEVELOPING PARAGRAPHS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V44						
YES	1	51 89.5	320 85.3	84 87.5	64 86.5	519 86.2
NO	2	6 10.5	55 14.7	12 12.5	10 13.5	83 13.8
Column Total		57 9.5	375 62.3	96 15.9	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
.89240	3	.8273	7.859	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V45   WRITING SENTENCES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V45						
YES	1	50 87.7	290 77.3	84 86.6	59 79.7	483 80.1
NO	2	7 12.3	85 22.7	13 13.4	15 20.3	120 19.9
Column Total		57 9.5	375 62.2	97 16.1	74 12.3	603 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.45241	3	.0916	11.343	None

Number of Missing Observations =   3

APPENDIX C

SPSS/PC+

Crosstabulation: V46   USING STANDARD ENGLISH GRAMMAR

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V46						
YES	1	49	283	79	58	469
		86.0	75.7	81.4	78.4	77.9
NO	2	8	91	18	16	133
		14.0	24.3	18.6	21.6	22.1
Column		57	374	97	74	602
Total		9.5	62.1	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.95342	3	.2665	12.593	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V47   NOTETAKING AND QUOTING

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V47						
YES	1	32	180	50	37	299
		56.1	48.5	52.1	50.7	50.1
NO	2	25	191	46	36	298
		43.9	51.5	47.9	49.3	49.9
Column		57	371	96	73	597
Total		9.5	62.1	16.1	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.36449	3	.7139	28.452	None

Number of Missing Observations =   9

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APPENDIX C

Crosstabulation: V48   EDITING AND REVISING

V143-> Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V48					
1 YES	45 78.9	285 76.2	80 82.5	58 78.4	468 77.7
2 NO	12 21.1	89 23.8	17 17.5	16 21.6	134 22.3
Column Total	57 9.5	374 62.1	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.83224	3	.6079	12.688	None

Number of Missing Observations =   4

Crosstabulation: V49   CHOOSING WORDS

V143-> Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V49					
1 YES	46 80.7	311 82.9	79 81.4	55 75.3	491 81.6
2 NO	11 19.3	64 17.1	18 18.6	18 24.7	111 18.4
Column Total	57 9.5	375 62.3	97 16.1	73 12.1	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.37559	3	.4982	10.510	None

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V50   USING INFO TECHNOLOGY

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V50						
YES	1	31	230	62	42	365
		54.4	61.8	63.9	56.8	60.8
NO	2	26	142	35	32	235
		45.6	38.2	36.1	43.2	39.2
Column Total		57 9.5	372 62.0	97 16.2	74 12.3	600 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.05229	3	.5616	22.325	None

Number of Missing Observations =   6

SPSS/PC+

Crosstabulation: V51   ABBREVIATIONS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V51						
YES	1	28	187	58	31	304
		52.8	50.8	59.8	42.5	51.4
NO	2	25	181	39	42	287
		47.2	49.2	40.2	57.5	48.6
Column Total		53 9.0	368 62.3	97 16.4	73 12.4	591 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.16209	3	.1603	25.738	None

Number of Missing Observations =   15

APPENDIX C
SPSS/PC+

Crosstabulation: V52   ACRONYMS

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V52						
YES	1	26 49.1	182 49.3	52 53.6	35 47.9	295 49.8
NO	2	27 50.9	187 50.7	45 46.4	38 52.1	297 50.2
	Column Total	53 9.0	369 62.3	97 16.4	73 12.3	592 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
.70831	3	.8712	26.410	None

Number of Missing Observations =   14

SPSS/PC+

Crosstabulation: V53   CAPITALIZATION

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V53						
YES	1	37 69.8	227 61.5	57 59.4	39 53.4	360 60.9
NO	2	16 30.2	142 38.5	39 40.6	34 46.6	231 39.1
	Column Total	53 9.0	369 62.4	96 16.2	73 12.4	591 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.63394	3	.3038	20.716	None

Number of Missing Observations =   15

Crosstabulation: V54   NUMBERS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V54						
YES	1	29 54.7	181 49.9	47 48.5	29 39.7	286 48.8
NO	2	24 45.3	182 50.1·	50 51.5	44 60.3	300 51.2
Column Total		53 9.0	363 61.9	97 16.6	73 12.5	586 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.31685	3	.3453	25.867	None

Number of Missing Observations =   20

Crosstabulation: V55   PUNCTUATION

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V55						
YES	1	45 84.9	275 74.5	74 76.3	55 75.3	449 75.8
NO	2	8 15.1	94 25.5	23 23.7	18 24.7	143 24.2
Column Total		53 9.0	369 62.3	97 16.4	73 12.3	592 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.74599	3	.4325	12.802	None

Number of Missing Observations =   14

APPENDIX C

SPSS/PC+

Crosstabulation: V56   REFERENCES

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V56						
YES	1	44 83.0	279 75.6	78 80.4	53 72.6	454 76.7
NO	2	9 17.0	90 24.4	19 19.6	20 27.4	138 23.3
	Column Total	53 9.0	369 62.3	97 16.4	73 12.3	592 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.86238	3	.4133	12.355	None

Number of Missing Observations =   14

SPSS/PC+

Crosstabulation: V57   SPELLING

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V57						
YES	1	38 71.7	247 66.9	62 63.9	39 53.4	386 65.2
NO	2	15 28.3	122 33.1	35 36.1	34 46.6	206 34.8
	Column Total	53 9.0	369 62.3	97 16.4	73 12.3	592 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.00903	3	.1112	18.443	None

Number of Missing Observations =   14

APPENDIX C
SPSS/PC+

Crosstabulation: V58   SYMBOLS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V58						
YES	1	31 58.5	214 58.0	57 58.8	37 51.4	339 57.4
NO	2	22 41.5	155 42.0	40 41.2	35 48.6	252 42.6
	Column Total	53 9.0	369 62.4	97 16.4	72 12.2	591 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.21609	3	.7491	22.599	None

Number of Missing Observations =   15

SPSS/PC+

Crosstabulation: V60   LETTERS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V60						
YES	1	40 70.2	248 67.4	77 80.2	46 63.9	411 69.3
NO	2	17 29.8	120 32.6	19 19.8	26 36.1	182 30.7
	Column Total	57 9.6	368 62.1	96 16.2	72 12.1	593 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.01196	3	.0715	17.494	None

Number of Missing Observations =   13

APPENDIX C
SPSS/PC+

Crosstabulation: V61   MEMOS

V143-→	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V61						
YES	1	38 66.7	299 81.0	73 76.0	52 72.2	462 77.8
NO	2	19 33.3	70 19.0	23 24.0	20 27.8	132 22.2
	Column Total	57 9.6	369 62.1	96 16.2	72 12.1	594 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.78239	3	.0507	12.667	None

Number of Missing Observations =   12

SPSS/PC+

Crosstabulation: V64   LITERATURE REVIEWS

V143-→	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V64						
YES	1	28 49.1	124 34.1	39 40.6	29 40.3	220 37.4
NO	2	29 50.9	240 65.9	57 59.4	43 59.7	369 62.6
	Column Total	57 9.7	364 61.8	96 16.3	72 12.2	589 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.75755	3	.1240	21.290	None

Number of Missing Observations =   17

SPSS/PC+

Crosstabulation: V65   MANUALS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V65						
YES	1	23 40.4	181 49.2	53 55.2	30 41.7	287 48.4
NO	2	34 59.6	187 50.8	43 44.8	42 58.3	306 51.6
	Column Total	57 9.6	368 62.1	96 16.2	72 12.1	593 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
4.65831	3	.1986	27.587	None

Number of Missing Observations =   13

SPSS/PC+

Crosstabulation: V66   NEWSLETTER ARTICLES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V66						
YES	1	13 22.8	83 22.9	30 31.3	17 23.6	143 24.4
NO	2	44 77.2	279 77.1	66 68.8	55 76.4	444 75.6
	Column Total	57 9.7	362 61.7	96 16.4	72 12.3	587 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.97252	3	.3959	13.886	None

Number of Missing Observations =   19

APPENDIX C
SPSS/PC+

Crosstabulation: V67   ORAL PRESENTATIONS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V67						
YES	1	52 91.2	353 95.7	93 96.9	69 95.8	567 95.5
NO	2	5 8.8	16· 4.3	3 3.1	3 4.2	27 4.5
	Column Total	57 9.6	369 62.1	96 16.2	72 12.1	594 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
2.85423	3	.4146	2.591	3 OF 8 (37.5%)

Number of Missing Observations =   12

SPSS/PC+

Crosstabulation: V71   INVESTIGATIVE REPORTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V71						
YES	1	27 56.3	236 68.4	60 64.5	44 67.7	367 66.6
NO	2	21 43.8	109 31.6	33 35.5	21 32.3	184 33.4
	Column Total	48 8.7	345 62.6	93 16.9	65 11.8	551 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
3.03398	3	.3864	16.029	None

Number of Missing Observations =   55

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APPENDIX C

SPSS/PC+

Crosstabulation: V72   LABORATORY REPORTS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V72						
YES	1	36 / 75.0	245 / 70.8	66 / 71.0	44 / 67.7	391 / 70.8
NO	2	12 / 25.0	101 / 29.2	27 / 29.0	21 / 32.3	161 / 29.2
Column Total		48 / 8.7	346 / 62.7	93 / 16.8	65 / 11.8	552 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
.71468	3	.8697	14.000	None

Number of Missing Observations =   54

SPSS/PC+

Crosstabulation: V73   PROGRESS REPORTS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V73						
YES	1	42 / 87.5	277 / 79.6	75 / 79.8	45 / 69.2	439 / 79.1
NO	2	6 / 12.5	71 / 20.4	19 / 20.2	20 / 30.8	116 / 20.9
Column Total		48 / 8.6	348 / 62.7	94 / 16.9	65 / 11.7	555 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.95714	3	.1137	10.032	None

Number of Missing Observations =   51

APPENDIX C
SPSS/PC+

Crosstabulation: V74   TEST REPORTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V74						
YES	1	33 68.8	281 80.7	74 79.6	47 72.3	435 78.5
NO	2	15 31.3	67 19.3	19 20.4	18 27.7	119 21.5
Column Total		48 8.7	348 62.8	93 16.8	65 11.7	554 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.28803	3	.1519	10.310	None

Number of Missing Observations =   52

SPSS/PC+

Crosstabulation: V76   TROUBLE REPORTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V76						
YES	1	17 35.4	185 53.3	51 54.8	28 43.1	281 50.8
NO	2	31 64.6	162 46.7	42 45.2	37 56.9	272 49.2
Column Total		48 8.7	347 62.7	93 16.8	65 11.8	553 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.58048	3	.0555	23.609	None

Number of Missing Observations =   53

APPENDIX C
SPSS/PC+

Crosstabulation: V78   HAS COMPUTER TECH INCREASED ABILITY TO C

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V78						
A LOT	1	30 57.7	200 59.2	63 67.7	49 70.0	342 61.8
A LITTLE	2	18 34.6	120 35.5	24 25.8	20 28.6	182 32.9
NOT AT ALL	3	4 7.7	18 5.3	6 6.5	1 1.4	29 5.2
Column Total		52 9.4	338 61.1	93 16.8	70 12.7	553 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
7.17442	6	.3050	2.727	3 OF 12 (25.0%)

Number of Missing Observations =   53

SPSS/PC+

Crosstabulation: V79   WORD PROCESSING

	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V79						
YES	1	48 94.1	309 92.0	92 98.9	70 100.0	519 94.4
NO	2	3 5.9	27 8.0	1 1.1		31 5.6
Column Total		51 9.3	336 61.1	93 16.9	70 12.7	550 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
11.46137	3	.0095	2.875	2 OF 8 (25.0%)

Number of Missing Observations =   56

APPENDIX C
SPSS/PC+

Crosstabulation: V80   OUTLINERS AND PROMPTERS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V80						
YES	1	4 7.8	41 12.4	7 7.6	7 10.0	59 10.8
NO	2	47 92.2	290 87.6	85 92.4	63 90.0	485 89.2
	Column Total	51 9.4	331 60.8	92 16.9	70 12.9	544 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.33716	3	.5054	5.531	None

Number of Missing Observations =   62

SPSS/PC+

Crosstabulation: V81   GRAMMAR AND STYLE CHECKERS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V81						
YES	1	3 5.9	35 10.5	17 18.5	7 10.0	62 11.4
NO	2	48 94.1	297 89.5	75 81.5	63 90.0	483 88.6
	Column Total	51 9.4	332 60.9	92 16.9	70 12.8	545 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.49002	3	.0901	5.802	None

Number of Missing Observations =   61

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APPENDIX C

SPSS/PC+

Crosstabulation: V84   BUSINESS GRAPHICS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V84						
YES	1	16 31.4	132 39.6	33 35.9	16 22.9	197 36.1
NO	2	35 68.6	201 60.4	59 64.1	54 77.1	349 63.9
	Column Total	51 9.3	333 61.0	92 16.8	70 12.8	546 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.62830	3	.0544	18.401	None

Number of Missing Observations =   60

SPSS/PC+

Crosstabulation: V87   USE DESK-TOP PUBLISHING

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V87						
ALWAYS	1	4 7.7	37 11.1	10 10.9	14 20.3	65 11.9
USUALLY	2	11 21.2	68 20.4	18 19.6	15 21.7	112 20.5
SOMETIMES	3	13 25.0	91 27.2	23 25.0	20 29.0	147 26.9
NEVER	4	24 46.2	138 41.3	41 44.6	20 29.0	223 40.8
	Column Total	52 9.5	334 61.1	92 16.8	69 12.6	547 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.62859	9	.4722	6.179	None

Number of Missing Observations =   59

APPENDIX C

SPSS/PC+

Crosstabulation: V88   AUDIO TAPES/CASSETTES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V88 ALREADY USE IT	1	10 18.5	76 21.0	24 25.3	7 10.0	117 20.1
DON'T BUT MAY	2	18 33.3	109 30.1	22 23.2	23 32.9	172 29.6
DOUBT IF I WILL	3	26 48.1	177 48.9	49 51.6	40 57.1	292 50.3
Column Total		54 9.3	362 62.3	95 16.4	70 12.0	581 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.75757	6	.2564	10.874	None

Number of Missing Observations =   25

SPSS/PC+

Crosstabulation: V90   VIDEO TAPE

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V90 ALREADY USE IT	1	21 37.5	167 45.8	46 47.9	40 54.8	274 46.4
DON'T BUT MAY	2	27 48.2	150 41.1	32 33.3	25 34.2	234 39.7
DOUBT IF I WILL	3	8 14.3	48 13.2	18 18.8	8 11.0	82 13.9
Column Total		56 9.5	365 61.9	96 16.3	73 12.4	590 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.10679	6	.3111	7.783	None

Number of Missing Observations =   16

APPENDIX C
SPSS/PC+

Crosstabulation: V92   FLOPPY DISKS

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            Count  IACADEMICIINDUS-  IGOVT    INASA    I
   V143-)    Col Pct INON-PROFITRIAL   I        I        I  Row
                   I        1 I      2 I      4 I      5 I Total
V92         --------+--------+--------+--------+--------+
               1  I    40  I   268  I    76  I    56  I   440
  ALREADY USE IT  I  70.2  I  73.0  I  79.2  I  78.9  I  74.5
                  +--------+--------+--------+--------+
               2  I    13  I    74  I    17  I     8  I   112
  DON'T BUT MAY   I  22.8  I  20.2  I  17.7  I  11.3  I  19.0
                  +--------+--------+--------+--------+
               3  I     4  I    25  I     3  I     7  I    39
  DOUBT IF I WILL I   7.0  I   6.8  I   3.1  I   9.9  I   6.6
                  +--------+--------+--------+--------+
            Column      57      367      96      71      591
            Total      9.6     62.1    16.2    12.0    100.0
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Chi-Square    D.F.      Significance      Min E.F.      Cells with E.F.( 5
-----------   ----      ------------      --------      -------------------

  6.67502       6          .3519           3.761        2 OF    12 ( 16.7%)
```

Number of Missing Observations =   15

SPSS/PC+

Crosstabulation: V93   COMPUTER CASSETTE TAPES

```
            Count  IACADEMICIINDUS-  IGOVT    INASA    I
   V143-)    Col Pct INON-PROFITRIAL   I        I        I  Row
                   I        1 I      2 I      4 I      5 I Total
V93         --------+--------+--------+--------+--------+
               1  I    12  I    84  I    22  I    10  I   128
  ALREADY USE IT  I  22.6  I  23.8  I  23.4  I  14.7  I  22.5
                  +--------+--------+--------+--------+
               2  I    19  I   136  I    39  I    28  I   222
  DON'T BUT MAY   I  35.8  I  38.5  I  41.5  I  41.2  I  39.1
                  +--------+--------+--------+--------+
               3  I    22  I   133  I    33  I    30  I   218
  DOUBT IF I WILL I  41.5  I  37.7  I  35.1  I  44.1  I  38.4
                  +--------+--------+--------+--------+
            Column      53      353      94      68      568
            Total      9.3     62.1    16.5    12.0    100.0
```

```
Chi-Square    D.F.      Significance      Min E.F.      Cells with E.F.( 5
-----------   ----      ------------      --------      -------------------

  3.54215       6          .7384          11.944            None
```

Number of Missing Observations =   38

APPENDIX C
SPSS/PC+

Crosstabulation: V96   FAX OR TELEX

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V96						
ALREADY USE IT	1	32 57.1	330 89.7	81 84.4	57 78.1	500 84.3
DON'T BUT MAY	2	16 28.6	25 6.8	10 10.4	13 17.8	64 10.8
DOUBT IF I WILL	3	8 14.3	13 3.5	5 5.2	3 4.1	29 4.9
Column Total		56 9.4	368 62.1	96 16.2	73 12.3	593 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
43.29548	6	.0000	2.739	3 OF 12 (25.0%)

Number of Missing Observations =   13

SPSS/PC+

Crosstabulation: V100   MICROGRAPHICS/FORMS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V100						
ALREADY USE IT	1	9 16.7	63 18.3	14 15.7	13 19.1	99 17.8
DON'T BUT MAY	2	19 35.2	157 45.5	45 50.6	24 35.3	245 44.1
DOUBT IF I WILL	3	26 48.1	125 36.2	30 33.7	31 45.6	212 38.1
Column Total		54 9.7	345 62.1	89 16.0	68 12.2	556 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.72515	6	.3470	9.615	None

Number of Missing Observations =   50

APPENDIX C
SPSS/PC+

Crosstabulation: V101   LASER/VIDEO DISC/CD-ROM

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V101						
1 ALREADY USE IT		3 5.6	17 4.8	8 8.7	7 10.0	35 6.2
2 DON'T BUT MAY		34 63.0	232 65.7	58 63.0	45 64.3	369 64.9
3 DOUBT IF I WILL		17 31.5	104 29.5	26 28.3	18 25.7	165 29.0
Column Total		54 9.5	353 62.0	92 16.2	70 12.3	569 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
4.24789	6	.6432	3.322	2 OF 12 (16.7%)

Number of Missing Observations =   37

SPSS/PC+

Crosstabulation: V103   PERSONAL KNOWLEDGE

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V103						
1 ALWAYS		25 43.9	147 39.4	46 47.9	37 50.7	255 42.6
2 USUALLY		25 43.9	183 49.1	37 38.5	31 42.5	276 46.1
3 SOMETIMES		7 12.3	43 11.5	13 13.5	5 6.8	68 11.4
Column Total		57 9.5	373 62.3	96 16.0	73 12.2	599 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
6.60523	6	.3589	6.471	None

Number of Missing Observations =   7

APPENDIX C
SPSS/PC+

Crosstabulation: V104   INFORMAL DISCUSSIONS WITH COLLEAGUES

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V104						
ALWAYS	1	7 12.3	71 19.0	24 24.7	18 24.7	120 20.0
USUALLY	2	29 50.9	220 59.0	56 57.7	38 52.1	343 57.2
SOMETIMES	3	20 35.1	81 21.7	17 17.5	17 23.3	135 22.5
NEVER	4	1 1.8	1 .3			2 .3
Column Total		57 9.5	373 62.2	97 16.2	73 12.2	600 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
13.97314	9	.1233	.190	4 OF 16 (25.0%)

Number of Missing Observations =   6

SPSS/PC+

Crosstabulation: V106   WITH EXPERTS IN ORGANIZATIONS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V106						
ALWAYS	1	9 16.4	69 18.4	16 16.7	18 24.7	112 18.7
USUALLY	2	18 32.7	196 52.4	53 55.2	37 50.7	304 50.8
SOMETIMES	3	27 49.1	106 28.3	24 25.0	18 24.7	175 29.3
NEVER	4	1 1.8	3 .8	3 3.1		7 1.2
Column Total		55 9.2	374 62.5	96 16.1	73 12.2	598 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
19.09896	9	.0244	.644	4 OF 16 (25.0%)

Number of Missing Observations =   8

APPENDIX C
SPSS/PC+

Crosstabulation: V107   WITH EXPERTS OUTSIDE ORGANIZATION

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V107						
ALWAYS	1	4 7.0	22 5.9	6 6.2	5 6.8	37 6.2
USUALLY	2	11 19.3	59 15.9	22 22.7	23 31.5	115 19.2
SOMETIMES	3	35 61.4	257 69.1	65 67.0	40 54.8	397 66.3
NEVER	4	7 12.3	34 9.1	4 4.1	5 6.8	50 8.3
Column Total		57 9.5	372 62.1	97 16.2	73 12.2	599 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
14.40566	9	.1086	3.521	3 OF 16 (18.8%)

Number of Missing Observations =   7

SPSS/PC+

Crosstabulation: V108   TECH REPORTS-GOVT

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V108						
ALWAYS	1	5 8.9	11 3.0	13 13.4	6 8.1	35 5.8
USUALLY	2	20 35.7	79 21.2	36 37.1	30 40.5	165 27.5
SOMETIMES	3	30 53.6	250 67.2	45 46.4	38 51.4	363 60.6
NEVER	4	1 1.8	32 8.6	3 3.1		36 6.0
Column Total		56 9.3	372 62.1	97 16.2	74 12.4	599 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
49.89497	9	.0000	3.272	4 OF 16 (25.0%)

Number of Missing Observations =   7

APPENDIX C
SPSS/PC+

Crosstabulation: V109   TECH REPORTS-OTHER

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V109						
ALWAYS	1	4 / 7.1	12 / 3.2	11 / 11.3	7 / 9.7	34 / 5.7
USUALLY	2	22 / 39.3	98 / 26.3	33 / 34.0	24 / 33.3	177 / 29.6
SOMETIMES	3	30 / 53.6	253 / 67.8	47 / 48.5	38 / 52.8	368 / 61.5
NEVER	4		10 / 2.7	6 / 6.2	3 / 4.2	19 / 3.2
Column Total		56 / 9.4	373 / 62.4	97 / 16.2	72 / 12.0	598 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
27.49947	9	.0012	1.779	5 OF 16 (31.3%)

Number of Missing Observations =   8

SPSS/PC+

Crosstabulation: V112   HANDBOOKS AND STANDARDS

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
V112						
ALWAYS	1	3 / 5.6	25 / 6.8	5 / 5.2	7 / 9.7	40 / 6.8
USUALLY	2	15 / 27.8	100 / 27.1	32 / 33.3	17 / 23.6	164 / 27.7
SOMETIMES	3	32 / 59.3	210 / 56.9	48 / 50.0	40 / 55.6	330 / 55.8
NEVER	4	4 / 7.4	34 / 9.2	11 / 11.5	8 / 11.1	57 / 9.6
Column Total		54 / 9.1	369 / 62.4	96 / 16.2	72 / 12.2	591 / 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
4.58519	9	.8689	3.655	2 OF 16 (12.5%)

Number of Missing Observations =   15

APPENDIX C
SPSS/PC+

Crosstabulation: V113   TECH INFO SOURCES/DATA BASES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V113						
ALWAYS 1			3 .8	4 4.2		7 1.2
USUALLY 2			28 7.7	6 6.3	7 9.7	41 7.0
SOMETIMES 3		26 51.0	163 44.7	33 34.4	40 55.6	262 44.9
NEVER 4		25 49.0	171 46.8	53 55.2	25 34.7	274 46.9
Column Total		51 8.7	365 62.5	96 16.4	72 12.3	584 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
21.94697	9	.0090	.611	5 OF 16 (31.3%)

Number of Missing Observations = 22

SPSS/PC+

Crosstabulation: V115   USE SCIENTIFIC AND TECH INFO

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V115						
YES 1		58 100.0	360 96.5	92 94.8	74 100.0	584 97.0
NO 2			13 3.5	5 5.2		18 3.0
Column Total		58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
5.95074	3	.1140	1.734	3 OF 8 (37.5%)

Number of Missing Observations = 4

APPENDIX C
SPSS/PC+

Crosstabulation: V116   EXPERIMENTAL TECHNIQUES

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V116						
YES	1	38 65.5	216 58.1	60 61.9	49 66.2	363 60.4
NO	2	20 34.5	156 41.9	37 38.1	25 33.8	238 39.6
	Column Total	58 9.7	372 61.9	97 16.1	74 12.3	601 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.61584	3	.4547	22.968	None

Number of Missing Observations =   5

SPSS/PC+

Crosstabulation: V119   COMPUTER PROGRAMS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V119						
YES	1	49 84.5	301 80.7	75 77.3	61 82.4	486 80.7
NO	2	9 15.5	72 19.3	22 22.7	13 17.6	116 19.3
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.38846	3	.7082	11.176	None

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V126   PRODUCE SCIENTIFIC AND TECH INFO

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V126						
	1	57	340	87	71	555
YES		98.3	91.2	89.7	95.9	92.2
	2	1	33	10	3	47
NO		1.7	8.8	10.3	4.1	7.8
	Column	58	373	97	74	602
	Total	9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
5.83412	3	.1200	4.528	1 OF 8 (12.5%)

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V129   DESIGN PROCEDURES AND METHODS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROF	TRIAL			Row
		1	2	4	5	Total
V129						
	1	22	189	41	30	282
YES		37.9	50.7	43.2	40.5	47.0
	2	36	184	54	44	318
NO		62.1	49.3	56.8	59.5	53.0
	Column	58	373	95	74	600
	Total	9.7	62.2	15.8	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
5.73458	3	.1253	27.260	None

Number of Missing Observations =   6

APPENDIX C
SPSS/PC+

Crosstabulation: V130   COMPUTER PROGRAMS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V130 YES	1	39 67.2	211 56.6	52 53.6	42 56.8	344 57.1
NO	2	19 32.8	162 43.4	45 46.4	32 43.2	258 42.9
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.96485	3	.3971	24.857	None

Number of Missing Observations =   4

SPSS/PC+

Crosstabulation: V136   PATENTS

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V136 YES	1	11 19.0	75 20.1	8 8.2	15 20.3	109 18.1
NO	2	47 81.0	298 79.9	89 91.8	59 79.7	493 81.9
	Column Total	58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.62811	3	.0544	10.502	None

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V137   HOW OFTEN USE LIBRARY/TECH INFO CENTER

V143->	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V137						
DAILY	1	2 3.4	8 2.1	2 2.1		12 2.0
2-6 TIMES A WEEK	2	11 19.0	32 8.6	12 12.4	5 6.8	60 10.0
ONCE A WEEK	3	11 19.0	46 12.3	18 18.6	15 20.3	90 15.0
2-3 TIMES A MONT	4	14 24.1	73 19.6	13 13.4	16 21.6	116 19.3
ONCE A MONTH	5	10 17.2	60 16.1	20 20.6	12 16.2	102 16.9
LESS THAN ONCE A	6	9 15.5	127 34.0	28 28.9	22 29.7	186 30.9
DO NOT USE	7	1 1.7	27 7.2	4 4.1	4 5.4	36 6.0
Column Total		58 9.6	373 62.0	97 16.1	74 12.3	602 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
26.26055	18	.0939	1.156	5 OF 28 (17.9%)

Number of Missing Observations =   4

APPENDIX C

SPSS/PC+

Crosstabulation: V139   HOW SEARCHES ARE DONE

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V139						
ALL MYSELF	1	4 11.4	12 8.4	1 2.5	1 2.3	18 6.9
MOST MYSELF	2	9 25.7	24 16.8	6 15.0	3 7.0	42 16.1
SELF/INTERMEDIAR	3	6 17.1	12 8.4	4 10.0	10 23.3	32 12.3
MOST INTERMEDIAR	4	9 25.7	49 34.3	16 40.0	18 41.9	92 35.2
ALL INTERMEDIARY	5	7 20.0	46 32.2	13 32.5	11 25.6	77 29.5
Column Total		35 13.4	143 54.8	40 15.3	43 16.5	261 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
18.56170	12	.0997	2.414	5 OF 20 (25.0%)

Number of Missing Observations =   345

SPSS/PC+

Crosstabulation: V140   GENDER

V143-)	Count Col Pct	ACADEMIC NON-PROF 1	INDUS- TRIAL 2	GOVT 4	NASA 5	Row Total
V140						
MALE	1	57 98.3	362 96.3	89 91.8	68 91.9	576 95.2
FEMALE	2	1 1.7	14 3.7	8 8.2	6 8.1	29 4.8
Column Total		58 9.6	376 62.1	97 16.0	74 12.2	605 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.(5
6.45793	3	.0913	2.780	3 OF 8 (37.5%)

Number of Missing Observations =   1

APPENDIX D

OPEN-ENDED COMMENTS

Formal training during school, especially related to the requirements of the workplace (proposals, specifications, project reports, memos, technical papers and other documents that must be generated in the job environment). Oral communications is also important but probably is not as important as the writing.

Undergraduate engineer must be taught, then called upon to write technical articles and reports. Engineer must be able to accurately and efficiently communicate (spoken word, written word and via sketches) to other technical persons.

The process must start in elementary school. I see too many young engineers with poor writing and communication skills. This lack of ability prohibits adequate transfer of knowledge via communication, and it inhibits their own advancement in their careers.

Engineers need to acquire good oral presentation skills. A good way to accomplish this would be to (1) present a problem before a group of people (2) then present a resolution to the problem plus any alternatives.

Infinite pains should be taken to present concise, understandable information, especially in summaries and short (1/2 hour) oral presentations. Detailed and/or esoteric information should be reserved for articles, textbooks, or discussions among experts.

Most engineering students are not prepared to communicate in writing or orally - this includes those prepared in the U.S. as well as international students.

More emphasis during undergraduate studies on communication - oral and written. Much more emphasis on the basics - spelling, punctuation, sentence structure, report organization. Most new (and old) engineers are pathetic report writers - they must do better!

Expand and focus undergraduate coursework in the technical communications area. Importantly, such training should be put into actual practice in parallel and

following-year work at <u>both</u> the undergraduate and graduate levels. Thesis requirements should probably be reemphasized.

Introduce undergrad course(s) in Technical Communication. Also, in laboratory courses correct the students' English.

Stress that effective communication is our most important and most difficult daily task.

Stress the importance of being able to communicate verbally as well as in writing in grammar and high school. One's ability to communicate will be what determines where one's career may go.

Stress undergrad course in written <u>and</u> oral communications.

Encourage engineering majors to read good works of literature and not just technical treaties.

In the past the engineering community has given <u>de facto</u> support to the proposition that engineers do not have to be well-developed communicators. This must stop. Providing more automated tools does little to improve the basic capability of a person to communicate effectively if he is already an adult who is functionally illiterate in English.

Provide on the job technical writing courses.

Teach engineers how to write effectively.

I strongly support a course (undergraduate level) which teaches organizational skills/techniques for report writing and oral presentations.

Part of the communication problem for young engineers is a "language barrier." What I learned at school and what I and my colleagues do at work are two completely different areas, requiring different "languages" and practices.

Ensure that engineers (<u>especially</u>) are literate in the English language. Many engineering curricula screen to downplay the humanities in general and English

composition in particular. Eschew Obfuscation eliminate unnecessary jargon (the same applies to our literature colleagues with long untranslated quotations from obscure and texts in "foreign" and often dead languages.

Have undergraduate students take more English classes.

It seems that I'm continually writing reports these days - I spend much time however, collaborating with my students on their theses and papers - I really wish some of them had a better background in general writing and grammar. This should be required for undergraduate engineers!! Certainly general rules of grammar and style should be "reviewed" (which are horribly lacking in high schools), and document organization should be called; i.e. figure out exactly what should be said and structure the document precisely such that it makes logical and sequential sense.

Include an effective communication course in the undergraduate school. Allow the master's thesis to be more real world and less realistic. Make undergraduates give technical papers as second author.

In my current position oral presentation is the most common and effective way of communicating my findings and analysis. Unfortunately, very little effort was made in my undergraduate career to prepare me for this type of work. Aside from short presentations in my technical writing and engineering courses there were no courses available to teach the proper methods and techniques of public speaking. I feel ABET should require a public speaking course for engineering students. Very few people are comfortable speaking in front of an audience and the only way of overcomming this fear is by "doing."

Educate the technical community about technical communication. Reduce the use of specifications which outline how correspondence is to be formatted without concern for the specific purpose of the communication. Return the emphasis of communication to the transmission of information in the most timely, cost effective, secure and concise method possible rather than blind following of standards. IE: Make people think about what they write and why they write it.

Improve undergraduate education. My experience in supervising new college graduates is that they are very deficient in writing skills.

Set some standards for the various communications media. This will make it easier to create/understand documentation. Do not make the standards so strict or complex that the documentation suffers, though.

Give engineering students more training in writing.

I believe the most important improvement to be made in communications is a simplification of language used in speaking, and writing. This could be accomplished by using jargon and acronyms less frequently.

Improve engineers and scientists writing and verbal communication and establish standards in terms of quality in paper and journal articles.

New engineers should be better trained in preparing technical information from analyses on testing. Too often information prepared is incomplete and poorly organized - with many assumptions, the objective, or conclusions missing.

Education at undergraduate level to improve organization of thoughts to effectively communicate information.

An emphasis needs to be put on educating college age students about clear, concise, and readable communication.

Upgrade presentation materials and presentations including written documents with purpose problem objective benefits of solution approach.

I believe that training at the college level is significantly below the tolerable minimum. Typically, communication type courses are electives while it is a technical requirement that the engineers and scientists of today effectively speak and present their ideas.

Foster technical publishing standards that are compatible with and accept output from personal computers.

Undergraduates could use some real-world experience in report writing.

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APPENDIX D

We should all write as much as possible while in school. Weekly reports on progress are often required at work. Perhaps a technical writing class could have 500 word weekly reports, in addition to normal assignments, on the students progress in other classes.

Require several technical writing courses for a BS degree.

Colleges must do a better job to prepare engineering students to write technical memos and reports. Private industry should also do a better job in training engineers to be excellent communicators.

Teaching people how to organize information and present it, recognizing the needs of people who receive the information.

Technical Writing and Speaking courses should be taught within technical curriculi, not as adjuncts and not by "creative writing" types with no technical backgrounds.

Perhaps we are not specifically involved in a concerted, integrated effort to improve technical communications. Is AIAA doing anything in this field? I feel very insecure in this area although I am frustrated by inadequate communications on a daily basis. Hope that you can do something about the problem.

I do not control the computer technology available to me. Both business and scientific graphics capability would be most welcome, as would integrated worksta- tions and electronic publishing. However, I (and my co-workers) just use what is provided to us.

Development of on-line data bases made _easily_ available to workers in industry (at their computer), would greatly increase the number of sources an engineer could consider while looking for info. A standard computer "search" at the library is controlled by the librarian, is too costly, and too inconvenient for regular use.

Undergraduate emphasis on writings and oral skills. Courses in modern communication tools and techniques.

APPENDIX D

Require courses in technical writing in the undergraduate curriculum.

I believe that in an undergraduate tech. comm. course the emphasis should be on presenting all necessary data in a clear and concise manner.

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National Aeronautics and Space Administration

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16. Abstract

A study was undertaken that explored several aspects of technical communications in aeronautics. The study, which utilized survey research in the form of a self-administered questionnaire, was sent to 2,000 randomly selected members of the American Institute of Aeronautics and Astronautics (AIAA). Six hundred and six (606) usable questionnaires (30.3 percent) were received by the established cut off date.

The study had five objectives. The first was to solicit the opinions of aeronautical engineers and scientists regarding the importance of technical communications to thier profession; second, to determine their use and production of technical communications; third, to seek their views on the content of an undergraduate course in technical communications; fourth, to determine their use of libraries/technical information centers; and finally, to determine the use and importance of computer and information technology to them. The findings add considerable information to the knowledge of technical communications practices among aeronautical engineers and scientists and reinforce some of the conventional wisdom about technical communications and question other widely-held notions.

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